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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,298	12/01/2003	George V. Popescu	YOR920030523US1	2858

7590 03/05/2008
Moser, Patterson & Sheridan
Suite 100
595 Shrewsbury Avenue
Shrewsbury, NJ 07702

EXAMINER

MEJIA, ANTHONY

ART UNIT	PAPER NUMBER
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2151

MAIL DATE	DELIVERY MODE
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03/05/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/725,298

Applicant(s)

POPESCU ET AL.

Examiner

ANTHONY MEJIA

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 14-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 14-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 11-13 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/ are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 03/04/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

A. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-10, and 14-20, drawn to a method for clustering and constructing a multi-type vector space, classified in class 709, subclass 223.
- II. Claims 11-13, drawn to a method of clustering nodes, classified in class 709, subclass 224.

B. The inventions are distinct, each from the other because of the following reasons:

1. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination of Invention I is drawn to the combination of:

obtaining a user's communication interests

obtaining network attributes;

obtaining application attributes;

forming a feature vector based on the obtained communication interest, network attributes and application attributes; and

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clustering the network nodes based on the obtained network attributes and on the obtained application attributes.

The subcombination of Invention II has separate utility such as clustering network nodes drawn to the combination of:

- forming network attribute maps of network constraints;
- forming a communication interest space map of application constraints;
- extracting feature vectors from the communication interest space map;
- extracting network feature vectors from the network attribute maps;
- obtaining network quality of service constraints; and
- application constraints.

The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

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2. Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

- (a) the inventions have acquired a separate status in the art in view of their different classification;
- (b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;
- (c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);
- (d) the prior art applicable to one invention would not likely be applicable to another invention;
- (e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election

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shall be treated as an election without traverse. Traversal must be presented^s at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

3. During a telephone conversation with Mr. Kin-Wah Tong on 2/19/08 a provisional election was made with without traverse to prosecute the invention of application 10/725298 Popescu et al., claims 1-10 and 14-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-13 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

5. The abstract of the disclosure is objected to because of the following informalities: abstract exceeds the limit of 150 words. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited.

6. The specification is objected to as failing to provide clear support or antecedent basis for the claimed subject matter. See 37 CFR 1.75(d) (1) and MPEP § 608.01(o). The meaning of every term and expressions used in any of the claims should be apparent from the descriptive portion of the specification with clear disclosure as to its import. In this case, the term "computer readable media" used in claims 14-20 are not

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apparent from the descriptive portion of the specification with clear disclosure as to its import. Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-2, 6-9, 14, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grimm et al. (US 5,828,843) (referred herein after as Grimm) and in further view of Modiri et al. (US 6,192,401) (referred herein after as Modiri)

Regarding Claim 1, Grimm teaches a method of constructing a multi-type feature vector comprising the steps of:

obtaining a user's communication interest (e.g., user's clients are selected into matched sets based on attributes of the client users, application, and the attributes of the servers and the properties of the client-to-client and client-to-server communication links, col. 1, lines 60-64);

obtaining network attributes (e.g., communication attributes, col.3, lines 33-37);

obtaining application attributes (e.g., match making system takes into account users preferences and attributes, col. 2, lines 5-6, and as discussed in col.3, lines 7-8).

Grimm does not explicitly teach forming a feature vector based on the obtained

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communication interest, network attributes, and application attributes.

However, Modiri in a similar field of endeavor discloses a system and method for determining cluster membership in a heterogeneous distributed system, including the step forming a feature vector (e.g., weighting values, based on user communication interest, network attributes, and application attributes (several factors) are calculated and combined (col.2, lines 41-44, lines 56-62, and col.6, lines 45-60) based on the obtained attributes.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Modiri in Grimm in order to determine a configuration for the nodes on a network. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings of Grimm and Modiri to help satisfy the desirability of having an optimized way in determining the membership for the nodes in the cluster (col.2, lines 13-15).

Regarding Claim 2, the combined teachings of Grimm and Modiri teach a method of clustering a multi-type vector space (Modiri: e.g., membership) comprising the steps of:

obtaining network attributes (Grimm: e.g., communication attributes, col.3, lines 33-37) from a network having a plurality of nodes (Grimm: e.g., each user client computer(s) is connected to a single server or multiple servers);

obtaining application attributes of an application (Grimm: e.g., match making system takes into account users preferences and attributes, col. 2, lines 5-6, and

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as discussed in col.3, lines 7-8); and
clustering (e.g., configuring) the network nodes based on the obtained attributes (Modiri: e.g., weighting values based on network attributes, and application attributes (several factors) of each node are calculated to choose an optimal configuration by clustering (configuring) the network nodes into a membership, col.2, lines 25-29 and 57-59, col.7, lines 8, lines 1-15)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Modiri in Grimm in order to configure the nodes to a particular desired group or membership. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings of Grimm and Modiri to be able to dynamically configure the nodes based on obtained desired factors.

Regarding Claim 6, the combined teachings of Grimm and Modiri teach the method of claim 2 as described above. Grimm further teaches obtaining client communication interest (e.g., client attributes, col.3 lines 1-5) and clustering the network nodes based on the obtained client communication interest (e.g., clients are selected into matched sets based on attributes of their users, the clients, application, and instance of users, the attributes of the servers and the properties if the client-to-client and client-to-sever communication links, col. 1, lines 60-64).

Regarding Claim 7, the combined teachings of Grimm and Modiri teach the method of claim 2 as described above. Grimm further teaches obtaining application attributes (e.g., match making system takes into account users preferences and attributes, col. 2, lines 5-6, and as discussed in col.3, lines 7-8) includes obtaining information regarding collaborative usage of the application (e.g., the matchmaker will choose a server if multiple servers are available and if the network application requires it. The moderator inherits the class attributes of the application when a match offer is created, col.3, lines 49-57).

Regarding Claim 8, the combined teachings of Grimm and Modiri teach the method of claim 2 as described above. Grimm further teaches obtaining network path loss information (e.g., packet-loss rate, col.8, lines 65-66), and such that clustering is based on the path loss information (e.g., match maker will consider network path loss (packet-loss rate) as part of matching up clients, col.9, lines. 12-16).

Regarding Claim 9, the combined teachings of Grimm and Modiri teach the method of claim 2, such that clustering (Grimm: e.g., match making bandwidth attributes with all the current clients, col.7, lines 49-51) is based on bandwidth constraints (Grimm: e.g., requirements (bandwidth)) necessary for data, col. 7, lines 36-39).

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Regarding Claim 14, the combined teachings of Grimm and Modiri teach this claim that states the computer readable medium that performs the steps of:

obtaining network attributes (Grimm: e.g., communication attributes, col.3, lines 33-37) from a network having a plurality of nodes (Grimm: e.g., each user client computer(s) is connected to a single server or multiple servers);

obtaining application attributes of an application (Grimm: e.g., match making system takes into account users preferences and attributes, col. 2, lines 5-6, and as discussed in col.3, lines 7-8); and

clustering the network nodes based on the obtained attributes (Modiri: e.g., weighting values based on network attributes, and application attributes (several factors) of each node are calculated to choose an optimal configuration by clustering (configuring) the network nodes into a membership, col.2, lines 25-29 and 57-59, col.7, lines 8, lines 1-15).

Regarding Claim 18, this claim states the computer readable medium that performs the steps of the method stated in claim 6, thus the same rationale of rejection is applicable.

Regarding Claim 19, this claim states the computer readable medium that performs the steps of the method stated in claim 7, thus the same rationale of rejection is applicable.

Regarding Claim 20, this claim states the computer readable medium that performs the steps of the method stated in claim 8, thus the same rationale of rejection is applicable.

9. Claims 3-4, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grimm in further view of Modiri, and yet in further view of Johnson (US. 6,078,946) (referred herein after as Johnson)

Regarding Claim 3, the combined teachings of Grimm and Modiri teach the method of claim 2 as described above. The combined teachings of Grimm and Modiri do not explicitly teach clustering that is performed by a fusion method in which network nodes are clustered in each attribute space on subspace classifiers.

However Johnson, in a similar field of endeavor, teaches clustering that is performed by a fusion method (where a fusion method is interpreted as being a subspace classification) in which network nodes are clustered in each attribute space on subspace classifiers (col.10, lines 14-16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Johnson in Grimm/Modiri in order to consider additional sub-attributes. One of the ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings of both Johnson and Grimm/Modiri to produce effective mutually dependent outcomes of the attributes used for the communication in the network.

Regarding Claim 4, the combined teachings of Grimm/Modiri and Johnson teach clustering is performed by a nested method in which network nodes are initially clustered based on a sub-set of attributes and then re-clustered by iteratively considering additional attributes (Johnson: e.g., the sub-classes are already nested within classes, but the comparison of the sub-classes will be considered as an aspect of determination of the best classes, which would include their attributes, col.10, lines 20-24).

Regarding Claim 15, this claim states the computer readable medium that performs the steps of the method stated in claim 3, thus the same rationale of rejection is applicable.

Regarding Claim 16, this claim states the computer readable medium that performs the steps of the method stated in claim 4, thus the same rationale of rejection is applicable.

10. Claims 5, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grimm in further view of Modiri, and yet in further view of Solotorevsky (US 2005/0010571) (referred herein after as Solotorevsky)

Regarding Claim 5, the combined teachings of Grimm and Modiri teach the method of claim 2. The combined teachings of Grimm and Modiri do not teach wherein further comprising forming network delay maps and forward capacity maps from the obtained network attributes, and such that clustering is based on the formed network

delay maps and on forward capacity maps.

However, Solotorevsky, in a similar field of endeavor, such as a system and method for generating policies for a communication network, discloses wherein further comprising forming forward capacity maps (e.g., maps calculated requirements such as forward capacity (e.g., bandwidth capacity) in a graphical representation of the network, par [0056], as demonstrated in fig.3 and network delay maps (e.g., delay, if is a network requirement that is calculated, may also be demonstrated in a graphical representation of the network as discussed in par [0060]), such that clustering is based on the formed network delay maps and on forward capacity maps (e.g., for each expected network requirement, each expected network requirement may be mapped to the elements of the symbolic network representation and its probability to demand the type of use it needs may be derived from (e.g., delay and bandwidth capacity), par [0060]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Solotorevsky in Grimm/Modiri to be able to have a symbolic representation of the constraints on the network. One of the ordinary skill in the art at the time the invention was made, would have been motivated to combine the teachings of Grimm/Modiri and Solotorevsky to be able to visually analyze a network map based on the specific network attributes and constraints that were obtained.

Regarding Claim 17, this claim states the computer readable medium that performs the steps of the method stated in claim 5, thus the same rationale of rejection is applicable.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grimm in further view of Modiri, and yet in further view of Tang et al. (US 2005/0076137) (referred herein after as Tang)

Regarding Claim 10, the combined teachings of Grimm and Modiri teach the method of claim 2 as described above. The combined teachings of Grimm and Modiri do not explicitly teach the clustering is based on weighted distance function modeled from normalized attribute subspace metrics.

However, Tang, in a similar field of endeavor, such as utilizing proximity information in an overlay network, discloses the clustering is based on weighted distance function (e.g., RTT) modeled from normalized attribute subspace metrics (par [0058]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Tang in Grimm/Modiri, in order to be able to be able to consider distance measurements. One of the ordinary skill of the art at the time the invention was made, would have been motivated to combine the teachings of Grimm/Modiri and Tang, to be able to determine the distance of the nodes within a

network overlay.

Other Pertinent Prior Art

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. Chen et al. (US 7,203,729) discloses a method and apparatus for a communication network with nodes capable of selective head operation.

B. Laiho et al. (US 2004/0117226) discloses a method for configuring a network by defining clusters.

C. Ye et al. (US 6,907,436) discloses a method for classifying data using clustering and classification algorithm supervised.

D. Bearden et al. (US 2003/0097438) discloses a network topology discovery systems and their use for determining suitability of a network for target applications

E. Xu et al. (US 2004/0181607) discloses a method and apparatus for providing information in a peer-to-peer network

F. Cuomo et al. (US 6,272,539) discloses methods, systems, and computer program products for determining and visually representing a user's overall network delay in collaborative applications.

G. Yoshida et al. (US 2005/0038909) discloses a static dense multicast path and bandwidth management.

H. Benmohamed et al. (US 6,909, 700) discloses a network topology optimization methods and apparatus for designing IP networks with performance guarantees.

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I. Cheston et al. (US 2005/0066033) discloses an apparatus, system, and method for dynamic selection of best network service.

J. Lampinen et al. ("Profiling Network Applications with Fuzzy C-Means Clustering and Self-Organization Map") discloses clustering methods using a fuzzy c-means algorithm,

K. Kumhyr et al. (US 2004/0068667) discloses a method and apparatus for securing and managing cluster computing in a network data processing system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY MEJIA whose telephone number is (571)270-3630. The examiner can normally be reached on Mon-Thur 9:30AM-8:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on 571-272-3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mejia, Anthony
Patent Examiner

ABDULHI SALAD
PRIMARY EXAMINER